A Temporal Basis for Acousmatic Rhythm

James Andean

Lecturer, Music, Technology and Innovation, De Montfort University
Leicester LE1 9BH, United Kingdom
james.andean@dmu.ac.uk

Leonardo Music Journal 26: “Lend Me Your Ears"

Abstract

In an attempt to begin to redress the relative lack of literature focused on rhythm in acousmatic music, this article is intended as a brief look at the acousmatic perspective on rhythm. This begins with a quick overview of discussion around rhythm in electroacoustic music more broadly, then contrasts this with some of Pierre Schaeffer's views on rhythm, and finally compares the perceptual temporal levels identified by Schaeffer with similar levels drawn from electroacoustic music, contemporary music, and cognitive psychology.

Introduction

Over the last twenty years or so, acousmatic music has experienced what we might call the 'rhythmic turn': metre and pulse have become a great deal more prevalent in recent acousmatic repertoire than it might have been in the decades prior. Of course metred pulse has never particularly been a taboo in acousmatic music, but, like melodic or harmonic materials, rhythm was perhaps, at least initially, a territory that musique concrète and acousmatic music could reference or access, but which perhaps wasn't central to the art form. This does not, however, mean that rhythm has been absent from non-metred acousmatic music; instead, we find rhythm naturally, though sometimes unconsciously, embedded within the 'objet sonore' (1).

Surprisingly little attention has been paid to acousmatic rhythm in the research literature; considering the recent upsurge in more openly rhythmic approaches within the genre, it is perhaps time to examine acousmatic rhythm more closely. This article is intended as a small opening contribution, that will briefly consider acousmatic rhythm from perhaps its broadest vantage point, as a range of temporal levels, and contrast these with perspectives drawn from a range of related fields.

Electroacoustic Rhythm

We might begin by first taking a moment to consider views on rhythm within electroacoustic music more generally. A certain amount of electroacoustic theory has proposed rhythm to be an, or even the, essential element of music. Xenakis proposed rhythm as an ultimate *sine qua non* (2), while Stockhausen proposed rhythm to be the fundamental parameter of all sound, which he famously demonstrates in *Kontakte* (3). More recently, Curtis Roads has similarly declared rhythm in electroacoustic music to be "the dominant element in a flux of ever-changing parameter interactions", or even "the sum total of all parameter interactions" (4).

Taking inspiration from Stockhausen and Xenakis, a primary thread in electroacoustic theory with regards to rhythm is an approach that extends rhythmic concerns across all temporal layers, from the smallest to the most extended conceivable time scales. Roads usefully identified a range of these time

scales, from 'infinite' all the way down to 'infinitesimal':

1) Infinite; 2) Supra; 3) Macro; 4) Meso; 5) Sound Object; 6) Micro; 7) Sample; 8) Subsample; 9) Infinitesimal (5)

Roads describes this as a sliding continuum: "Time scales interlink. A given level encapsulates events on lower levels and is itself subsumed within higher time scales. Hence to operate on one level is to affect other levels." (6) In other words, rhythm in electroacoustic music is nested across the entire range of time levels – from the most vast, to the tiniest imaginable divisions, well beyond the limits of perceptibility.

Acousmatic Rhythm

Some of this, however, has relatively little application to acousmatic music, in that, while theoretically fascinating, it is perhaps perceptually dubious**.** The connections between rhythm and pitch or timbre, as described by Stockhausen and Xenakis, are essentially mathematical: despite these theoretical relationships and continua, we nevertheless perceive rhythm, pitch, and timbre as cognitively distinct - albeit related and mutually dependent - qualities. The extension of rhythm to the infinite and infinitesimal extremes proposed by Roads, while once again fascinating, very clearly extends not only far beyond the limits of our concept of rhythm, but far beyond the very limits of human perception and understanding. Acousmatic music, on the other hand, is predicated on perception and reception (7), and as a result these more hypothetical theories of rhythm are arguably less useful to the acousmatic composer.

Much of what is commonly referred to as 'rhythm', in fact, takes place only at Roads' 'Sound Object' level, and possibly also at the 'Meso' level; discussion of acousmatic rhythm would likely focus primarily on these two levels, possibly extending in as far as level six (Micro), and out as far as level three (Macro). We find this reflected somewhat in the literature – for example Pierre Schaeffer (as summarized by Michel Chion) talks about 'duration': "we can distinguish short, medium, and extended durations"; "human perception functions best within an optimal temporal space, which is a medium duration... Hence the choice of the three values of duration: (too) short - (ideally) medium - (too) long." (8)

'Kairos' vs. 'Chronos'

Schaeffer importantly, and typically, specifies 'duration' as a question of "psychologically experienced" time, as opposed to "chronometric" time (9). This is a fairly significant distinction. The Greek language, for example, has two distinct words for time: *kairos* and *chronos*, where 'chronos' refers to "chronological time, the concept of time as a clock mode", while 'kairos' refers to time as "a temporal dimension of meaning, informing the correct understanding and interpretation of events, perceptions, actions, and cognitions" (10). This clearly aligns with Schaeffer's distinction, and we could thereby argue that acousmatic music generally, and acousmatic rhythm more specifically, is deliberately and explicitly concerned almost entirely with 'kairos' rather than 'chronos'.

Temporal Levels

A relationship can be proposed between Roads and Schaeffer, in which 'micro' = 'short', 'meso' and 'sound object' = 'medium', and 'macro' = 'long', with everything further out on Roads' spectrum clearly falling into Schaeffer's 'too long' or 'too short' categories. Godøy makes a similar claim, proposing

'micro', 'meso' and 'macro' as correlates of Schaeffer's 'short', 'medium' and 'long' (11), which once again fits well with Roads' categories, if we continue to lump Roads' 'meso' and 'sound object' together, and include steps 1 to 3 under the 'macro' umbrella and steps 7 to 9 under the 'micro' umbrella. Lerdahl and Jackendoff make a similar tripartite distinction into "three zones": metrical structure, transitional zone, and grouping structure (12), which line up once again with what we've seen so far, as well as proposing 'the tactus' (13), which they would likely put under 'metrical structure', whereas in acousmatic music we might tend to correlate this with the 'transitional zone'.

The fact that, again and again, we find theorists marking out such similar areas is no coincidence, and is clearly linked to our perception and our cognitive processing. Cognitive psychology has offered us the idea of cognitive 'chunking' in terms of memory and our experience of time, and again we find an identification of three time-scales in our experience of music: the 'subchunk' – the short, microtemporal, related to microstructure, with durations from 30 to 300 ms; the 'chunk' – the mesotemporal, related to gesture, with durations from 300 ms to 3 sec); and the 'superchunk' – the macrotemporal, related to form, with durations from 3 to roughly 30 or 40 sec (14 & 15). These can also be linked to 'working memory', 'short-term memory', and 'long-term memory' (16), and are fairly directly responsible for other elements of acousmatic theory, for example Schaeffer's 'stress-articulation' (17).

Roads	Infinitesimal/ Subsample	Micro	Sound Object	Meso	Macro	Supra/ Infinite
Schaeffer	Too short	Short	Medium		Long	Too long
Godøy	Micro		Meso		Macro	
Lerdahl & Jackendoff	---	Metrical structure	Transitional zone		Grouping structure	---
Cognitive psychology	---	Subchunk	Chunk		Superchunk	---
Memory	---	Working memory	Short-term memory		Long-term memory	---

Figure 1 - Rhythmic temporal levels

Conclusion

In other words, we find that theorists and research across a range of fields – from the acousmatic literature, to electroacoustic theorists, to broader areas of musicology, and onwards to cognitive research – all come to very similar conclusions regarding the primary temporal levels in our musical perception. As per Schaeffer, these levels, at least in a shared central area of Roads' broader range, relate directly to the levels at which we perceive and identify musical rhythm. This alignment of concepts with research results, developed independently and in different fields over a span of decades, is very informative, and supports acousmatic music's claims to a thorough grounding in human perception and experience.

References

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